19th October

Byjus

Category: ECONOMICS 1. The measure of the working woman

Syllabus: Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment. Mains: Women's labour force participation- rate, issues, and the need for providing support. Prelims: About Women's labour force participation rate and gender-related issues.

Context

The article discusses the importance of empowering women in India's growing economy and highlights the challenges women face in unpaid care work and the need for suitable support.

Introduction

- The inclusion of women in India's growing economy is crucial for the nation's ambitions of becoming a $5 trillion economy.
- Two key aspects must be addressed: appropriately valuing women's work, especially in caregiving roles, and supporting women's participation in the formal workforce.

The Issue of Unpaid Care Work

- The majority of women in India engage in unpaid domestic services, such as caregiving for children, the sick, and the elderly.
- This "double burden" of unpaid care work, combined with their paid work outside the home, leads to gender inequality.
- Women's unpaid work contributes significantly to the economy, equivalent to 7.5% of GDP.

Challenges in Valuing Women's Work

- Women's unpaid work often goes unnoticed and unaccounted for in official records, affecting labour and employment policies.
- Governments should advocate for changes in the System of National Accounts to reflect the value of this labour.
- Statistical invisibility limits the applicability of protective labour legislation.

Supporting Women in Low-Income Families

- In low-income households, both parents often have to work, breaking the traditional breadwinner-caregiver model.
- Low-income women work without adequate support, but their work patterns are often seasonal, sporadic, and irregular.
- They need suitable childcare options for stable employment, especially in urban areas.

The Role of Creches

- Creches offer a solution by providing childcare services. The National Creche Scheme operates thousands of such centres.
- Creches help mothers build stable careers while ensuring the safety and development of their children.
- The private sector recognizes the need for childcare services, making it a growing industry.

Closing the Gender Gap

- India's women's labour force participation rate (FLFPR) lags behind other countries in the region.
- To empower Indian women, their work must be appropriately recognized and supported to raise FLFPR.

Nut Graf: *As India aims to become a $5 trillion economy, valuing women's work, especially unpaid caregiving, and supporting women in low-income families are essential for increasing women's participation in the formal workforce.*

Category: SCIENCE AND TECHNOLOGY 1. The explosion of digital uncertainty

Syllabus: Effects of scientific developments in everyday life Mains: Growing concerns about the exponential rise in digital uncertainty

Context: Recent advancements in Generative Artificial Intelligence (AI) have gained widespread attention, with governments, businesses, and the public recognizing the opportunities and challenges it presents.

- In India, the government has released a comprehensive report on AI's potential. However, amidst this AI revolution, there's a growing concern about the exponential rise in digital uncertainty, which is poorly understood.
- This digital uncertainty poses significant threats and implications that demand our attention.

Concerns:

- **Scant Understanding of Implications**
  - The complexity of digital infrastructure, composed of machine intelligence, human-coded software, and hardware components, is not well understood by the majority.
  - This complexity leads to vulnerabilities, yet there's limited awareness of the potential risks.
- **Cognitive Warfare**
  - Cognitive warfare, akin to other forms of modern warfare, involves destabilizing institutions and manipulating media using advanced techniques.
  - It relies on technology to alter human cognition subtly, which can result in a loss of trust, breaches of confidentiality, and changes in population behaviour.
- **Digital Transformation Risks**
  - With companies investing heavily in intangible assets and migrating to the cloud, they expose themselves to AI-related risks.
  - As sensors continuously transmit sensitive data, these risks multiply, leading to concerns about the future.
- **Morphing into Radical Uncertainty**
  - Digital uncertainty is evolving into radical uncertainty at a rapid pace, with misinformation and disinformation causing "truth decay."
  - Governments are struggling to combat the impact of AI-driven misinformation and manipulation of information.
- **The Emergence of AGI**
  - Artificial General Intelligence (AGI), on the horizon, is seen as more disruptive and dangerous than current AI.
  - AGI's capacity to influence thinking and decision-making across various domains can have far-reaching consequences, including social and economic inequalities.
- **Geo-Political Implications**
  - AGI could reshape the geo-political balance of power, leading to digital colonialism where a few locations control AGI-based power centres.
  - This new form of exploitation, resembling data colonialism, can exacerbate inequalities and disparities.
- **The 'Oppenheimer Moment'**
  - There's a need to consider the ethical implications and control of AGI's development, as it has the potential to reshape the world in unexpected ways.
  - The challenges of controlling AGI development and fostering collaboration between states and the technology sector are complex.

Artificial general intelligence (AGI)

- Artificial general intelligence (AGI) is the representation of generalized human cognitive abilities in software so that, faced with an unfamiliar task, the AGI system can find a solution. The intention of an AGI system is to perform any task that a human being is capable of.
- An AGI system should have the following abilities and understanding:
  - Abstract thinking
  - Background knowledge
  - Common sense
  - Cause and effect
  - Transfer learning

The Hamas-Israel Conflict: A Case Study: AI's role in the Hamas-Israel conflict highlights the dangers of over-reliance on AI. Israel's intelligence failure was attributed to an excessive dependence on AI, which Hamas manipulated. This incident serves as a cautionary tale against blind trust in AI.

Nut Graf: *The explosion of digital uncertainty, coupled with the imminent emergence of AGI, presents profound challenges and opportunities. As we stand at the crossroads of computing and technology ethics, it is crucial to understand and control the power of AI and AGI. Fostering collaboration between states and the technology sector is a necessary step in managing these transformations and preventing catastrophic consequences.*

Category: INTERNATIONAL RELATIONS

1. The BRI at 10, some hits, many misses

Syllabus: Effect of policies and politics of developed and developing countries on India's interests. Mains: Significance and concerns about Belt and Road Initiative (BRI)

Context: The Belt and Road Initiative (BRI) has been a significant global undertaking by China, aimed at fostering economic connectivity and development. As the initiative completes a decade, it is crucial to assess its impact, achievements, and challenges. The recent Third Belt and Road Forum for International Cooperation in Beijing brought the initiative into focus, shedding light on its evolution and repercussions.

Issues:

- **BRI's Intent and Early Debates:** BRI was conceived as a means for China to transition from a regional power to a global one and to reboot globalization. It sought to address concerns about the vulnerability of China's economy due to the Strait of Malacca.
- **Global Influence and Branding:** BRI served as a platform for President Xi Jinping to project China's global power and influence. It entered the Chinese Communist Party's constitution and gained prominence in the nation's plans and international cooperation pacts.
- **Massive Infrastructure Gap:** The World Bank has identified significant global infrastructure deficits in areas like electricity, potable water, and broadband coverage. BRI aimed to bridge these gaps with substantial investments in infrastructure projects.
- **Unsavoury Realities:** Despite the lofty goals, BRI has faced criticism and challenges. Ecological damage, displacement of people, disputes over payments, and labour issues have marred its progress. Examples from Indonesia, Laos, and the China-Pakistan Economic Corridor (CPEC) illustrate these concerns.
- **Perceptions of Inequality:** BRI's "win-win cooperation" slogan has been tarnished by perceptions that it primarily benefits China at the expense of other stakeholders, as seen in cases like Gwadar Port's revenue distribution.

Significance:

- **Global Infrastructure Investment:** BRI's significance lies in its substantial investments in infrastructure, addressing critical global infrastructure deficits.
- **China's Global Power Projection:** BRI has allowed China to assert itself as a global power, with economic and political influence across nations.
- **Alternative Initiatives:** The challenges posed by BRI have spurred the development of alternative initiatives, such as the United States-Japan infrastructure investment, the Build Back Better World (B3W) initiative, and the India-Middle East-Europe Corridor (IMEC).

Solutions:

- **Addressing Environmental and Social Concerns:** China should address ecological and social issues associated with BRI projects to improve its reputation and ensure genuine cooperation.
- **Transparency and Equity:** Promote transparency and equitable agreements in BRI projects to counter perceptions of inequality.
- **Global Alternatives:** Encourage global alternatives to BRI, like the B3W initiative and IMEC, that prioritize sustainable development and equitable cooperation.

Nut Graf: *As the Belt and Road Initiative reaches its ten-year mark, it is essential to recognize both its successes and challenges. While it has contributed to global infrastructure development and elevated China's global influence, it has also faced criticism for issues related to environmental and social impacts, perceived inequality, and opaque agreements. The emergence of alternative initiatives underscores the need for cooperation that benefits all stakeholders.*

1. Sea service

Syllabus: GS 2 – International Relations Prelims: Nagapattinam-Kankesanthurai ferry service

Introduction

- The recent launch of a passenger ferry service between Kankesanthurai, Sri Lanka, and Nagapattinam, Tamil Nadu, fulfils a long-standing demand for a sea link across the Palk Strait.
- The civil war in Sri Lanka disrupted traditional maritime routes between the two nations.

Historical Context

- In the past, there were ferry services such as Colombo to Thoothukudi and Chennai to Talaimannar via Rameswaram.
- Multiple transport links were disrupted due to the 1964 cyclone in Dhanushkodi and the Sri Lankan civil war.
- People in both countries were left to rely solely on air services, with the Chennai-Jaffna air service resuming ten months ago.

Importance of the Ferry Service

- The new ferry service strengthens cultural, economic, and civilizational ties and supports cooperation in disaster management and maritime security.
- It may facilitate the repatriation of Sri Lankan refugees living in Tamil Nadu.

Challenges to Address

- The ferry service is set to resume normal operations in January. Authorities must work to ensure its sustainability.
- The fare, approximately ₹7,670 per person, is not competitive with airfares, and increasing baggage allowance could attract more passengers.
- Nagapattinam port needs to provide amenities like a dormitory and improve rail connectivity for passengers visiting Chennai.

Promoting Economic Ties

- Sri Lanka should consider promoting economic ties, including exports from the Northern Province, to address the bilateral relationship's inherent asymmetry.
- Sustained policy attention is crucial to the success of the Nagapattinam-Kankesanthurai ferry service.

1. MQ – 9B drones

Introduction

- India is set to acquire 31 MQ-9B Unmanned Aerial Vehicles (UAVs) from the United States.
- The agreement is projected to be finalised by February 2024, and deliveries are scheduled to commence in February 2027, marking a three-year gap after the contract is signed.

Key Developments

1. Deal Status and Timeline

- The MQ-9B UAV deal is progressing as planned.
- The Letter of Offer and Acceptance (LOA) from the U.S. government is awaited.
- The contract is anticipated to be finalised by February 2024.

2. UAV Maker's Commitment

- The UAV manufacturer, General Atomics (GA), is in the process of setting up a worldwide facility for maintenance, repair, and overhaul within India.

- The exact location for the facility is yet to be determined, but Bengaluru is a likely choice.

3. Clearance and Costs

- In June, India's Defense Ministry approved the procurement of 31 MQ-9B UAVs from GA, valued at an estimated cost of $3,072 million.
- The procurement consists of 15 Sea Guardians designated for the Navy, as well as eight Sky Guardians allocated to both the Army and the Air Force.

4. Procurement Process

- The Letter of Request (LoR) was issued to the U.S. government just before Prime Minister Narendra Modi's talks with U.S. President Joe Biden at the G-20 summit.
- The LoR serves as the basis for finalising the Letter of Offer and Acceptance (LOA), specifying equipment and procurement terms in line with the U.S. Foreign Military Sales (FMS) program.

5. Approval and Conclusion

- The U.S. administration is required to inform the U.S. Congress about the sale.
- The deal will then need approval from the Indian government's Cabinet Committee on Security before the contract can be concluded.

2. Centre raises MSP for Rabi crops

Introduction

- The Cabinet Committee on Economic Affairs (CCEA) has announced an increase in Minimum Support Prices (MSP) for all Rabi crops for the financial year 2024-25.
- The increment has been criticised by farmers' organisations as insufficient to cover rising input costs.

Key MSP Increases

1. Wheat

- Wheat, a major Rabi crop, receives a ₹150 per quintal increase in MSP.
- The new MSP for wheat is ₹2,275 per quintal.

2. Lentils (Masur)

- The MSP for lentils has seen the highest increase compared to the previous year, with a ₹425 per quintal rise.
- The new MSP for lentils stands at ₹6,425 per quintal.

3. Rapeseed and Mustard

- Rapeseed and mustard crops have an MSP increase of ₹200 per quintal.
- The new MSP for rapeseed and mustard is ₹5,650 per quintal.

Farmers' Criticisms

- Farmers' organisations have expressed dissatisfaction with the MSP hikes, stating that they do not adequately account for increased input costs.
- They point to rising prices of fertilisers and diesel, which have added to the farmers' expenses.

Procurement Concerns

- Some farmers' representatives have questioned the meaningfulness of MSP without an effective procurement system in place.
- They highlight the importance of ensuring that farmers can actually sell their produce at the MSP rates to benefit from these increases.

Vajiram and Ravi

OBCs and Subcategories: Why This Has Been a Hot-Button Issue for Long

Context

- **The publication of the results of the caste survey in Bihar** earlier this month **had raised the possibility that other states too would announce similar exercises**.
- In a recent development, the Minister for Backward Classes Welfare **in Andhra Pradesh said that the state will begin a backward classes census.**
- The enumeration of castes, as well as **the sub-categorisation of the Other Backward Classes (OBCs) to ensure equity in the distribution of reservation benefits have been issues of debate for long.**

The Origin of the Term OBC and its Constitutional Affirmation

- **Origin of the Term OBC**
  - The expression OBC was **coined to denote backward/ marginalised communities** and castes that were not Scheduled Castes (SCs) or Scheduled Tribes (STs).
  - It is recognised that **social backwardness in India has traditionally been a direct consequence of caste status,** and that other types of backwardness have flowed from this initial handicap.
- **Constitutional Affirmation of the Term OBC**
  - Affirmative action for OBCs is **mandated by Article 15(4)** of the Constitution.
  - Nothing in this article or in Article 29 (2) [non-discrimination with regard to admission into state educational institutions] **shall prevent the State from making any special provision for the advancement of any socially and educationally backward classes of citizens.**
  - **Article 16(4) allows the state to make any provision for the reservation**of appointments or posts in favour of any backward class of citizens which, in the opinion of the State, is not adequately represented in the services under the State.

Sub Categorisation of OBCs: Backwards Among OBCs

- OBCs have been generally **identified based on their occupation:**
  - Cultivation of own land,
  - Tenant farming,
  - Agriculture labour,
  - Cultivation and selling of vegetables,
  - Fruits and flowers,
  - Cattle-rearing,
  - Washing of clothes,
  - And carpentry, blacksmiths, oilseeds crushing, pottery, stone-cutting, etc.
- The many castes among the OBCs are at **different levels of marginalisation.Two broad categories within the OBCs:**
  - Those who own land (such as the Yadavs and Kurmis in Bihar and UP),
  - And those who do not.

Extremely Backward Class: Understanding the Case of Bihar

- **Bihar Government's Exercise, 1951**
  - The Bihar caste survey **identified 27% of the population as "pichhda" (backward), and 36% as "atyantpichhda" (Extremely Backward Classes, or EBCs).**
  - In 1951, the Bihar government had prepared **a list of 109 castes, 79 of which were deemed to be more backward than the remaining 30.**
  - But in 1964, **Patna HC struck down the two lists** as unconstitutional.
- **Bihar Government's Mungeri Lal Commission**
  - In June 1970, the **Bihar government appointed the Commission**, which in its report **named 128 backward communities, 94 of which were identified as most backward.**
  - The Janata Party government of **CM Karpoori Thakur implemented the recommendations of the Mungeri Lal Commission.**
  - The Karpoori Thakur Formula provided **26% reservation, of which OBCs got a 12% share**, the **economically backward classes among the OBCs got 8%, women got 3%, and the poor from the upper castes got 3%.**
- **Subsequent Caste Politics in Bihar**
  - To build a base for himself beyond his own small Kurmi caste, CM Nitish Kumar has made **efforts to reach out to the backward OBCs (mainly**

the artisan castes) to the exclusion of the upper OBCs, mainly Yadavs whose loyalties lie with his rival turned ally Lalu Prasad.
    - Like the ati-pichhda backwards (EBCs), **a category of Mahadalits has been identified among the Scheduled Castes.**
    - The OBC reservation in Bihar is **currently divided among groups that are called Backward Classes or BC-I, BC-II, and OBC Women.**
    - This could change as and when the findings of the caste survey are sought to be acted upon.

The OBC Commissions on National Level and Their Outcomes

- **First OBC Commission**
    - The panel, headed by Kaka Kalelkar, was constituted by Jawaharlal Nehru's government in 1953, and submitted its report in 1955.
    - To **identify socially and educationally backward classes**, the commission adopted the following criteria:
        - Low social position in the traditional caste hierarchy of Hindu society;
        - Lack of general educational advancement among the major section of the caste/ community;
        - Inadequate or no representation in government service;
        - And inadequate representation in trade, commerce and industry.
    - The First OBC Commission **prepared a list of 2,399 backward castes** or communities in the country, **categorised 837 of them as most backward.**
    - The Commission also **recommended enumerating castes in the 1961 census, providing 25-40% reservation at different levels of government jobs, and 70% reservation for admission to technical and professional institutions.**
    - The report was never discussed in Parliament and never implemented as the government decided that **any all-India list drawn up by the Central Government would have no practical utility.**
- **Second OBC Commission (Mandal Commission)**
    - This commission **was appointed in 1979 by Morarji Desai's Janata government** but the implementation of which was announced only in 1990 by the government of V P Singh.
    - The Mandal Commission **identified 3,743 castes and communities as OBCs,** estimated their population at 52%, and **recommended 27% reservation** in government jobs and admissions to all government-run scientific, technical, and professional institutions.
    - **No subcategories were recognised within the 27% OBC quota**. One of the members, L R Naik, said in his dissent **that OBCs should be split into intermediate backward classes and depressed backward classes.**
    - The Centre's Official Memorandum on the implementation of the Mandal recommendations said that within the 27% reserved for SEBCs, preference shall be given to candidates belonging to the poorer sections of the SEBCs.
    - However, **the central government has always implemented the quota treating the entire OBC population as one block** after excluding the "creamy layer" of affluent candidates **based on criteria fixed after a Supreme Court ruling.**

The Status of OBC Subcategories in Different States

- Over the decades, **state governments have applied their own criteria to distribute quota benefits** among the various categories of OBCs.
- This process began well before the Mandal recommendations were implemented at the Centre.
- **In Andhra Pradesh,** OBCs are divided into five subcategories: Aboriginal tribes, Professional group (like tappers), SC converts to Christianity and their progeny, etc.
- **In Karnataka**, 207 OBCs castes are divided into five sub-groups.
- **Jharkhand has two groups:** Extremely Backward Classes (EBCs) and Backward Classes.
- **West Bengal's** 143 OBC castes are divided into More Backwards and Backwards.
- **In Maharashtra,** the 21% OBC reservation is shared by the Special Backward Category (2%) and Other Backward Classes (19%).
- **In Tamil Nadu**, the 50% OBC quota is divided among Backward Classes (26.5%), Backward Class Muslims (3.5%), and Most Backward Classes/Denotified Community (20%).

Conclusion

- The Bihar Caste survey report has **triggered a national debate over caste composition** and its share and no political party can afford to ignore it now.
- According to experts, **the survey report would force political parties to announce and initiate more welfare schemes for the poor and marginalised sections of society.**
- The demand for reservation for the backwards among OBCs has gained traction as the feeling has grown that **a handful of upper OBCs have grabbed most of the benefits of the 27% reservation**. Editorial Analysis

Orionid meteor shower

The Orionid meteor shower is expected to rain down its greatest number of meteors on the mornings of October 21 and 22.

About Orionid meteor shower:

- It is an annual phenomenon that lights up the night sky every October.
- It is produced when Earth passes through the **debris left behind by Halley's Comet**, officially known as **1P/Halley.**
- This comet, which orbits the sun approximately every 76 years, expels dust particles from its nucleus, creating a trail of debris in its path.
- Each year, our planet intercepts this path in late October, resulting in the Orionid meteor shower.
- Halley's Comet, measuring about five by nine miles in size, loses between three to ten feet of material on each passage through the inner solar system.
- The Orionids are **viewable in both the Northern and Southern hemispheres**during the hours after midnight.

What is a meteor?

- When **meteoroids enter Earth's atmosphere** at high speed and burn up, the fireballs or "shooting stars" are called meteors.
- Meteor showers occur annually or at regular intervals as the Earth passes through the trail of dusty debris left by a comet.
- Meteor showers **are usually named after a star or constellation** that is close to where the meteors appear in the sky.

Source: India Today Science & Tech

Ethics Committee in Parliament

Recently, the Lok Sabha Speaker referred the complaint against a sitting member of parliament to the House Ethics Committee.

About Ethics Committee in Parliament:

- The genesis of formation of the Ethics Committee in Parliament can be traced to a resolution adopted at the Presiding Officers Conference held in New Delhi in October, 1996.
- **Each house of the** parliament has its own ethics committee.
- **Ethics committee in Lok Sabha**
    - It was first constituted in 2000.

    - **Composition:** It consists of **not more than fifteen members and nominated by the Speaker.**
    - **Term**: They shall hold office for a term **not exceeding one year.**
- **Ethics committee in Rajya Sabha**
    - It was constituted in 1997.
    - **Composition:** It consists of **10 members** nominated by the Chairman of Rajya Sabha.
    - **Term:** They shall hold office for a term **not exceeding one year.**
- **Functions**
    - To oversee the **moral and ethical conduct of the Members**;
    - To examine the cases referred to it with reference to ethical and other misconduct of the Members.
- Any person or member may make a complaint relating to unethical conduct of a member to the committee.
- In the case of the Ethics Committee only an MP can be examined for misconduct.

Source :IE Polity & Governance

Kati Bihu

Recently, the Prime Minister of India extended best wishes on the auspicious occasion of Kati Bihu to the people of Assam.

About Kati Bihu:

- It is celebrated in the **state of Assam.**
- Kati means to cut and this day marks the **time of relocation of rice saplings**.
- It is also known as **Kongali Bihu.** (Kongali means poor)
- There are **another two Bihu festivals** celebrated in Assam - **Bhogali** or Magh Bihu is observed in January and **Rongali** or Bohag Bihu is observed in the month of April.
- **Significance**
    - During this month, there are not so many things to eat.
    - They celebrate this festival by lighting the earthen lamps or candles and lit their house with lighting.
    - **Lighting diya near Tulsi plant** is one of the main part of the festival. They worship Tulsi plant on this auspicious day.
    - People also light a special lamp **called "Akash Banti"** (Sky candle) in their paddy fields.
    - These lamps are fueled by mustard oil and are kept high on the tip of bamboo poles.
    - People believe that these **lighted lamps will guide their ancestors towards heaven.**

Source :PIB History & Culture

What is the TV-D1 Mission?

Indian Space Research Organisation (ISRO) is set to launch its first-ever test flight, TV-D1, for the Gaganyaan mission, marking a pivotal moment in India's pursuit of human spaceflight.

About TV-D1 Mission:

- Test Vehicle Abort Mission-1 (TV-D1) will evaluate the **crew module's readiness** for the Gaganyaan mission.
- It is a **single-stage liquid rocket developed** specifically for this abort mission.
- The payloads consist of the **Crew Module (CM)** and **Crew Escape Systems (CES)** with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters.
- This flight will simulate the abort condition during the ascent trajectory corresponding **to a Mach number of 1.2** encountered in the Gaganyaan mission.

What is the test all about?

- The abort and crew escape system operates on a similar principle to an ejection seat found in fighter jets, with the primary goal of safeguarding the lives of crew members in the event of in-flight anomalies.
- The **Crew Escape System** is engineered to automatically function across various altitudes should the onboard computer detect any malfunctions.
- This test flight will simulate an abort condition during the ascent trajectory.
- **Objective:** To test a crucial system to be **deployed on the Gaganyaan mission** that will ensure the safety of the Indian astronauts in case of an emergency in the initial phase of the launch.
- CES with CM will be separated from the Test Vehicle at an altitude of about 17 km.
- Subsequently, the abort sequence will be executed autonomously commencing with the separation of CES and deployment of the series of parachutes, finally culminating in the safe touchdown of CM in the sea, about 10 km from the coast of Sriharikota.

Source :HIndu Science & Tech

Niemann-Pick Disease

Recently, parents of children suffering from Niemann-Pick disease have urged the Union government to notify the ailment under the National Policy for Rare Diseases.

About Niemann-Pick Disease:

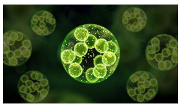
- It is a rare genetic disorder in which **sphingomyelin accumulate**in lysosomes inside cells.
- This disease involves **dysfunctional metabolism of sphingolipids.**
- The three most commonly recognized forms are Niemann-Pick **Types A and B and Type C.**
- This disease can affect the brain, nerves, liver, spleen, bone marrow and, in severe cases, lungs.
- People with this condition experience symptoms related to progressive loss of function of nerves, the brain and other organs.
- It **can occur at any age** but mainly affects children.
- **Causes**:
    - It is inherited **in an autosomal recessive pattern**, which means both copies of the gene, must be defective to cause the disease.
    - Most often, the **parents of a child with an autosomal recessive disorder**are carriers: they have one copy of the altered gene, but are not affected because the other copy produces the enzyme.
    - If both parents are carriers, each pregnancy has a 25% chance of producing an affected child.

- **Symptoms**
    - Enlargement of the liver and spleen (**Hepatosplenomegaly**)
    - Low levels of platelets in the blood(Thrombocytopenia)
    - Slurring of speech (**dysarthria**)
    - Difficulty in swallowing (dysphagia)
    - Abnormal posturing of the limbs, trunk, and face (dystonia).
    - Voluntary rapid eye movements (supranuclear gaze palsy).
    - Gradual loss of intellectual abilities, causing dementia and seizures
- **Classification**
    - **Types A and B:** Mutations in the **SMPD1 Gene cause** types A and B.
    - They produce a deficiency in the activity of the lysosomal enzyme acid sphingomyelinase that breaks down the lipid sphingomyelin.
    - **Types C:** Mutations in NPC1 or NPC2 cause Niemann–Pick disease, type C (NPC), which **affects a protein used to transport lipids**. It is the **most common form** of the disease includes types C1 (95% of type C) and C2.
- **Treatment :** No specific treatment is known for type A and B, but symptoms are treated.

Source :TOI Health

What is Microalgae?

Microalgae, which form the base of the food chain in the ocean and capture carbon dioxide from the atmosphere, appear to rely on a unique strategy to cope with global warming, according to a new study.



About Microalgae:

- Microalgae are **microscopic algae**, typically **found in freshwater and marine systems**.
- They are **unicellular species** that **exist individually or in** chains or groups.
- They are **comprised of unicellular algal species**, **g. green algae, diatoms**, and dinoflagellates.
- Depending on the species, their **sizes can range** from a **few micrometers**(μm) **to a few hundreds of micrometers.**
- **The color** of the algae is **influenced by the predominant pigments** in an algal cell. Thus, they are **grouped according to their color: green, red, or brown.**
- Unlike higher plants, microalgae **do not have roots, stems, or leaves.**
- They are **mostly photosynthetic**. Their ability to photosynthesize is **due to the presence of photosynthetic pigments.**
- **Those that lack photosynthetic pigments are heterotrophs** and therefore feed on other organisms.
- **Importance:**
    - They form the **base of the food chain**, providing essential nutrients for zooplankton, small fish, and other aquatic organisms. They are a **primary food source for filter-feeding organisms.**
    - Photosynthetic microalgae play a **vital role in the global carbon and oxygen cycles.** They **absorb carbon dioxide** and **produce oxygen through photosynthesis,** which helps mitigate climate change and contributes to oxygen generation. They **produce approximately half of the atmospheric oxygen**.
    - Microalgae can **form symbiotic relationships** with other organisms. For example, they **live within the tissues of corals (zooxanthellae)** and **provide them with nutrients** through photosynthesis.
    - **Some** of them **are also capable of fixing nitrogen**. Eg: Nostoc, Anabaena, and Oscillatoria.
    - They are **rich in nutrients** and can serve as a **food source for humans.Spirulina and Chlorella,** two types of microalgae, are often consumed as dietary supplements.

What is Macroalgae?

- Macroalgae, commonly **called seaweeds**, are **marine plants that photosynthesize**, but **reproduce without flowers**.
- They are **visible to the naked eye** (in contrast to microalgae) and generally **grow attached to the seabed** or reef substrate.
- They are **important components of the reef ecosystem, providing food and habitat** to a diverse range of species while also playing a **key role in nutrient dynamics**.

What is an algal bloom?

- An algal bloom is the **overgrowth of microscopic algae** or algae-like bacteria **in fresh, salt, or brackish waters.**
- They are a **result of excess nutrients** from fertilizer, wastewater, and stormwater runoff, coinciding with lots of sunlight, warm temperatures, and shallow, slow-flowing water.
- **Depending on the type of algae** or bacteria that cause it, **an algal bloom may produce bad-smelling scum, foam, froth**, or a paintlike slick.
- Algal blooms **can be many colors**, including **blue-green, yellow, brown, pink, and red.**
- **A harmful algal bloom, or HAB,** is a bloom that **produces toxins** that are **dangerous to humans and** potentially **other organisms.**
- **Not all algal blooms are toxic.**

Source :Down to earth Environment

What is Automated Permanent Academic Account Registry (APAAR)?

The Union Education Ministry recently notified the States to begin the process of introducing the Automated Permanent Academic Account Registry or 'APAAR'.

About Automated Permanent Academic Account Registry (APAAR):

- APAAR, dubbed **'One Nation, One Student ID',** is an **Education Ecosystem Registry,** or an **'EduLocker'**.
- The APAAR will **give each student enrolled from pre-primary to higher education**, a **unique identification number.**
- This will be **in addition to** the already existing **Aadhaar ID that every individual has**.
- Upon enrolling in APAAR, each **student's identity will be authenticated through their Aadhaar ID or** other officially **recognised documents**, and a distinct identification number will be generated for them.
- **Benefits**:

  - The APAAR, or EduLocker will be a **lifelong ID number for** students for seamless **tracking of their academic journey** and achievements.
  - They will be **able to digitally store their exam results, learning outcomes, co-curricular achievements** such as ranking in Olympiads or receiving specialised skill training, and much more.
  - **Transcripts, certificates, and** other **academic achievements may be easily stored and accessed** by students, **boosting their capacity to apply for employment, scholarships**, or higher education opportunities.
  - In addition to that, **students transferring from one school** to another will **face less hassle in obtaining admission to a new institution** in any part of the country.
  - It would make it **easier for authorities,** educational boards, and institutions **to track student progress, monitor performance**, and **assess the effectiveness of education policies.**
  - It will also **help government agencies monitor dropouts**.
- **Enrolment process:**
- The enrolment process will be **carried out by the school** with the **consent of their parents,** who will also be **able to withdraw their consent at any** given point of **time**.
- The government assured that the **data will be shared only with concerned government agencie**s if and **when required.**
- The data collected on each student by the schools will **be stored in a centrally functioning District Information for Education portal.**

Source : TOI APAAR: All you need to know about this 'One Nation, One ID' to be rolled out for students Government Schemes and Initiatives

Organized Crime and Corruption Reporting Project (OCCRP)

The Securities and Exchange Board of India (SEBI) recently asked the Organized Crime and Corruption Reporting Project (OCCRP) to give it access to "key documents" about the allegations of stock manipulation and accounting fraud against the Adani Group.

About Organized Crime and Corruption Reporting Project (OCCRP):

- OCCRP is a **nonprofit investigative reporting platform for 50+ independent media outlets** around the world, **publishing more than 100 investigations a year.**
- It was **founded in 2006 to conduct transnational investigative reporting**and promote technology-based approaches **to exposing organised crime and corruption worldwide.**
- It **aims to develop and equip a global network of investigative journalists**and **publish their stories.**
- With this, OCCRP **exposes crime and corruption** so the public can hold power to account.
- **Vision**: "A world where lives, livelihoods, and democracy are not threatened by crime and corruption."
- OCCRP **provides media outlets and journalists with a range of critical resources and tools,** including digital and physical security, **and allows those covering** the most **sensitive topics to work in teams with trusted editors.**
- **OCCRP Aleph:** It is **an investigative data platform** where journalists can **search and cross-reference** more than **three billion records to trace criminal connections** and patterns and **efficiently collaborate across borders.**
- It **also trains reporters** and partners **in advanced journalism techniques.**
- OCCRP **also partners with advocacy groups**, arming civil society with information to meaningfully press for justice and change and **unearths evidence that enables law enforcement to act.**

Source :Wire SEBI Approached OCCRP for Documents on Adani Allegation Polity & Governance

What is Diphtheria?

The World Health Organization (WHO) recently said that the Health Ministry of Guinea has reported an outbreak of diphtheria.

About Diphtheria:

- It is a highly **contagious and infectious disease** that causes severe **inflammation of the nose, throat, and windpipe** (trachea).
- **Cause**: It is caused by strains of **bacteria called Corynebacterium diphtheriae** that **make a toxin.** It is the toxin that can cause people to get very sick.
- **Transmission:**
  - The infection **can transmit from a person with the infection to any mucous membrane** in another person.
  - Diphtheria bacteria spread from person to person, u**sually through respiratory droplets**, like from coughing or sneezing.
  - People can also get sick **from touching infected open sores or ulcers**.
- **Symptoms:**
  - Diphtheria signs and symptoms usually **begin 2-5 days after a person becomes infected.** Signs and symptoms may **include**:
    - A **thick, gray membrane covering the throat and tonsils**
    - A **sore throat** and hoarseness
    - **Swollen glands** (enlarged lymph nodes) in the neck
    - **Difficulty breathing** or rapid breathing
    - **Nasal discharge**
    - Fever and chills
    - **Tiredness**
  - **If the toxin gets into the blood stream**, it can **cause heart, nerve, and kidney damage.**
  - The bacteria **can also infect the skin, causing open sores or ulcers**. However, diphtheria skin infections **rarely result in severe disease**.
- **Treatment**: Treatment aimed at countering the bacterial effects **has two components:**
  - **Antitoxin**: This is also known as **anti-diphtheritic serum**. It **neutralizes the bacteria's toxins**. Doctors use the antitoxin to **treat diphtheria that** has**affected the respiratory system**. The antitoxin **only works on toxins** that have **not yet bound with cells** and tissue in the body.
  - **Antibiotics**: Erythromycin or penicillin **can eradicate the bacteria and stop them from spreading.** Antibiotics **can treat diphtheria affecting** the **respiratory system and skin.**

Source :FE Diphtheria outbreak in Guinea: 538 cases and 58 deaths reported; Know all about this disease Health

What is General Provident Fund (GPF)?

The Department of Personnel and Training (DoPT) recently issued a letter explaining the procedure retiring AIS officers on central deputation can follow to claim GPF.

About the General Provident Fund (GPF):

- It is a type of **provident fund** account that is **available only for government employees** in India.
- The primary objective of this fund is to p**rovide a dependable source of retirement income** for government employees.

- **It allows** government employees **to accumulate savings over their employment tenure**.
- **Eligibility**: The following are eligible to subscribe to a GPF account:
    - All **temporary government servants** who have given their **service continuously for one year**
    - **All re-employed pensioners** (except those eligible for admission to the contributory provident fund)
    - All **permanent government servants**
    - A **private sector worker is not eligible** for the General Provident Fund
- **Contribution:**
    - It is a **mandatory scheme for government employees**, requiring them to **contribute a certain percentage of their salary** towards the fund.
    - The contributions are **deducted from the employee's monthly salary**, and the amount **earns interest at a predetermined rate**.
    - **Employees can also increase the GPF deductions** as per their choice.
- **Withdrawal:**
    - Employees can withdraw their savings from the fund **upon retirement or resignation from service.**
    - A GPF **is flexible**, **allowing employees to withdraw** money from the fund for various **reasons, such as marriage, education,** and **medical emergencies.**
    - Employees **can also take out loans against their GPF account**, subject to certain conditions.
    - **Employees who transfer to another government department or leave their** job **can withdraw** their GPF balance **or transfer it to their new employer.**
    - The GPF sum will be **paid to their nominee if the employee passes away**.
- It also offers a **competitive interest rate**, **revised quarterly.**
- The GPF scheme is **administered by the Department of Pension and Pensioners' Welfare,** falling under the **Ministry of Personnel, Public Grievances and Pensions.**
- This scheme offers **several benefits** to government employees, including **tax savings, low-risk investments, and guaranteed returns.**

Source :FE General Provident Fund (GPF) payment on retirement: DoPT explains procedure for these AIS officers Economy

Israel accused of using controversial white phosphorus shells in Gaza

Why in news?

- Two humanitarian organizations have accused the Israel Defense Forces (IDF) of using white phosphorus munitions in violation of International Humanitarian Law (IHL) in Gaza and Lebanon.
- The IDF has denied the allegations.

What's in today's article?

- White phosphorus

What is white phosphorus?

- White phosphorus is a pyrophoric that ignites when exposed to oxygen, producing thick, light smoke as well as intense **815-degree Celsius heat**.
    - Pyrophoric substances are those which ignite spontaneously or very quickly (under five minutes) when in contact with air.
- Under the Globally Harmonized System of Classification and Labeling of Chemicals, white phosphorus falls under "**Pyrophoric solids, category 1**".
- White phosphorus emits a distinct garlic-like odour.

What are the military uses of white phosphorus?

- White phosphorus is dispersed in artillery shells, bombs, and rockets. It can also be delivered via felt (textile) wedges soaked in the chemical.
- Its primary military use is as a smokescreen — used to hide troop movement on the ground.
- White phosphorus is also known to mess with infrared optics and weapons tracking systems, thus protecting forces from guided missiles.
- Munitions can either be ground-burst for more concentrated smoke, or air-burst in order to cover a larger area.
- White phosphorus can also be used as an incendiary weapon.

How harmful is white phosphorus?

- Upon exposure, white phosphorus can cause severe burns, often down to the bone.
- The burns are painful, difficult to heal, and susceptible to infections.
- Particles of white phosphorus that remain lodged the body can reignite if in contact with air.
- Inhaling white phosphorus particles or smoke can cause respiratory damage and harm to internal organs.
- Those who survive initial injuries often experience a lifetime of suffering — with impaired mobility and painful, horrific scars.
- White phosphorus can also devastate infrastructure and property, damage crops and kill livestock, with raging fires, especially in windy conditions.

When were white phosphorus munitions first used?

- Irish nationalists in the late 19th century first used white phosphorus munitions, in a formulation that became known as "Fenian fire".
    - Fenian was an umbrella term for the Irish nationalists.
- World War I saw extensive use of the chemical by the British and Commonwealth forces in phosphorus grenades, bombs, shells and rockets.
- These munitions have since been used in conflicts around the world, from the Normandy invasion in World War II to the US invasion of Iraq in 2004 and the long-drawn Nagorno-Karabakh conflict.
- Most recently, Russia was accused of using white phosphorus bombs during the invasion of Ukraine last year.

What is the legal status of white phosphorus munitions?

- **Use is regulated**
    - White phosphorus munitions are not under a blanket ban, though their use is regulated under the International Humanitarian Laws.
- **Not considered a chemical weapon**
    - Since its operational utility is primarily due to heat & smoke, rather than toxicity.
    - Thus, its use is governed by the **Convention on Conventional Weapons (CCW), specifically Protocol III**, which deals with incendiary weapons.
        - Palestine and Lebanon have joined Protocol III, while Israel has not ratified the protocol.
        - Incendiary weapons are weapons that use fire and heat to set fire to objects or cause burn or respiratory injury to people.
- **Protocol III of CCW regulates the use of incendiary weapons**
    - Protocol III prohibits the use of airdropped incendiary weapons in concentrations of civilians. However, it has two significant loopholes.
    - First, it **restricts some** but not all use of ground-launched incendiary weapons where there are concentrations of civilians.
    - Second, the protocol's definition of incendiary weapons covers weapons that are primarily designed to set fire to and burn people.
        - **It excludes multipurpose munitions** such as those containing white phosphorus, which are considered to primarily be "smoking" agents. International Relations

Vizhinjam port project and its significance

Why in news? Kerala Chief Minister flagged in the first-ever cargo ship at the under-construction Vizhinjam international seaport project, the country's first deepwater transshipment port.

What's in today's article?

- Deepwater trans-shipment port
- Vizhinjam international seaport project

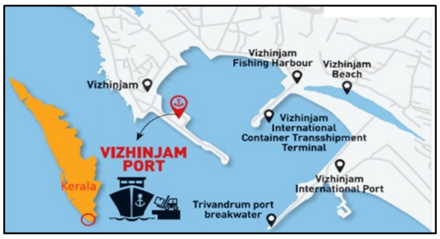
Deepwater transshipment port

- **Deepwater port**
  - A deepwater port is a manmade structure that are used as ports or terminals to transport, store, or handle oil or natural gas.
  - These structures can be fixed or floating, and are located beyond state seaward boundaries.
  - They can include: Pipelines, Pumping stations, Service platforms, Mooring buoys.
- **Transshipment port**
  - A transshipment port is a port where goods are offloaded and loaded onto a different ship to continue their journey to their final destination.

Why India needs a container transshipment port?

- **Lacks infrastructure to deal with ultra-large container ships**
  - India has **13 major ports**. However, the country lacks a landside mega-port and terminal infrastructure to deal with ultra-large container ships.
  - Hence, nearly 75 per cent of India's transshipment cargo is handled at ports **outside India, mainly Colombo, Singapore, Dubai and Klang**.
  - In fiscal 2021-22, the total transshipment cargo of India was about 4.6 million TEUs (twenty-foot equivalent units), out of which about 4.2 million TEUs were handled outside India.
- **Othe benefits**
  - Developing such ports will accrue **significant benefits such as forex savings**, foreign direct investment, increased economic activity at other Indian Ports.
  - It will also lead to the **development of related logistics infrastructure**, employment generation, improved operation/logistics efficiencies and increase in revenue share.
  - Several other **allied businesses** ship chandlery (ship supplies), ship repair, crew change facility, logistics value-added services, warehousing and bunkering also come up at the transshipment port.
- **Increased economic activities**
  - A deepwater container transshipment port can attract a **large share of the container transshipment traffic**.

Vizhinjam International Seaport Project


Vizhinjam
Vizhinjam Fishing Harbour
Vizhinjam Beach
Vizhinjam International Container Transshipment Terminal
VIZHINJAM PORT
Kerala
Vizhinjam International Port
Trivandrum port breakwater

- Located in Vizhinjam (near Thiruvananthapuram), Kerala, this transshipment deepwater multipurpose seaport project is being built by Adani Ports and SEZ Private Limited.
- It is being built on a **design, build, finance, operate and transfer (DBFOT) model**.
  - DBFOT model is a Public-Private Partnership (PPP) model. In this model, a private partner is responsible for:
    - Designing the project
    - Building the project
    - Financing the project
    - Operating the project during the contracted period
    - Transferring the project back to the public sector
  - The DBFOT model is usually used for large-scale infrastructure projects.
  - The private partner is granted a concession by the public sector to finance, design, construct, own, and operate the project for a period of 20 to 30 years.
  - After that period, the project is returned to the public entity that originally granted the concession.
- According to the agreement, out of the total investment, Adani Group is supposed to invest Rs 2,454 crore and another Rs 1,635 crore will be mobilised from the state and central governments as viability gap funding.
- The Kerala government has given 500 acres of land.
- The DBFOT deal is for 40 years, with provisions extending for 20 years.

What are the features of the Vizhinjam port?

- **India's first international deepwater transshipment port**
  - It has a natural depth of more than 18 meters, scalable up to 20 meters.
    - This depth is crucial to get large vessels and mother ships.
  - It is designed to cater to container transshipment, multi-purpose and break-bulk cargo.
  - The cost of movement of containers to and from foreign destinations is likely to come down.
- **Strategic location**
  - The port is located ten nautical miles from the international shipping route.
  - The port is expected to compete with Colombo, Singapore, and Dubai for winning trans-shipment traffic.
- **Increased capacity and minimum maintenance**
  - Its capacity in the first phase is one million TEU, which can be increased to 6.2 million TEU.
  - Other features include minimal littoral drift along the coast and virtually no requirement for any maintenance dredging.
- **Economic benefits**
  - The project is expected to generate 5,000 direct job opportunities, apart from giving a boost to an industrial corridor and cruise tourism.
  - Vizhinjam port offers large-scale automation for quick turnaround of vessels with state-of-the-art infrastructure to handle Mega-max container ships.

Current status of the project

- As per the latest assessment, 65.46 per cent of the project is done.
  - As per the latest work schedule, the first phase of the project is slated to be operational in December 2024.
- After inking the deal in 2015, the project was supposed to be made operational in 1,000 days. It had set a target to handle 20 million tons of cargo by 2020.
- The 2017 **Ockhi cyclone**, the **Covid-19 pandemic**, the acute shortage of granite boulders to build a 3.1-km breakwater and last year's fishermen's protest contributed to the delay. Economics

What Caused the Largest Marsquake?

Why in News?

- Just like on Earth, the surface of Mars sometimes vigorously shakes and unsurprisingly, that is called a marsquake.
- The largest ever marsquake recorded in history happened in 2022 and scientists now finally know the reason behind it.

What's in Today's Article?

- Background (Marsquake, Significance of the Findings)
- Plate Tectonics (Meaning, How it Works, etc.)

Background:

- On May 4, 2022, NASA's **InSight lander** detected the largest quake yet recorded on Mars, one with a 4.7 magnitude. It is fairly modest by Earth's standards but strong for Mars.
- Unlike Earth, Mars doesn't have the same geological process called plate tectonics which usually causes earthquakes.
- Initially, scientists thought that a meteorite impact might be the culprit behind this unusual "marsquake."
- However, their search for an impact crater did not lead to any findings. This led scientists to a new conclusion – this particular quake was actually triggered by tectonic activity happening within Mars itself.

- It is like rumbling deep inside the planet, giving researchers a better understanding of what makes Mars tremble and move.
- This discovery sheds new light on the seismic activities of Mars.

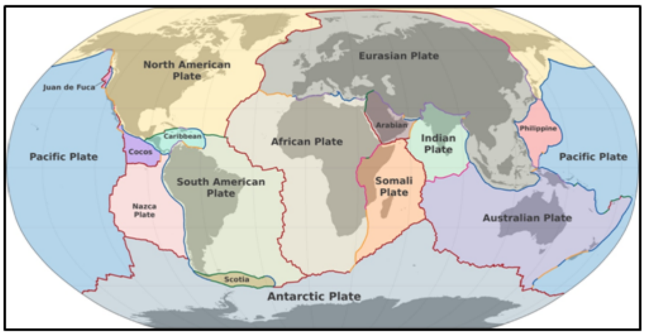
Significance of This Finding:

- Scientists concluded that the largest marsquake seen by InSight was tectonic, not an impact. This is important as it shows the faults on Mars can host hefty marsquakes.
    - The energy released during this particular marsquake was more powerful than all the other marsquakes InSight had recorded combined.
- Unlike Earth, where the outer layer, called the crust, is divided into big plates that move around and cause earthquakes, **Mars has a single, unbroken crust**.
- The findings reveal that there are still faults that are active on Mars.
- **The planet is still slowly shrinking and cooling**, and there is still motion within the crust even though there are no active plate tectonic processes going on anymore. These faults can trigger quakes.
- Considering the upcoming human missions to Mars, a greater understanding of Martian seismic activity is pertinent.
- With information from studies like this one, **we might understand where it would be safe for humans to land on Mars and where it would be better to avoid a launch**.

Tectonic Plates & How They Cause Earthquakes:

- A tectonic plate (also called lithospheric plate) is a **massive, irregularly shaped slab of solid rock, generally composed of both continental and oceanic lithosphere**.
- Plate size can vary greatly, from a few hundred to thousands of kilometres across; the Pacific and Antarctic Plates are among the largest.
- Plate thickness also varies greatly, ranging from **less than 15 km for young oceanic lithosphere to about 200 km or more for ancient continental lithosphere** (for example, the interior parts of North and South America).
- **How do these massive slabs of solid rock float despite their tremendous weight?**
    - The answer lies in the composition of the rocks.
    - **Continental crust is composed of granitic rocks** which are made up of relatively lightweight minerals such as **quartz** and **feldspar**.
    - By contrast, **oceanic crust is composed of basaltic rocks**, which are much denser and heavier.
    - Because continental rocks are much lighter, the crust under the continents is much thicker (as much as 100 km) whereas the crust under the oceans is generally only about 5 km thick.
    - Like icebergs, only the tips of which are visible above water, continents have deep "roots" to support their elevations.
    - Most of the boundaries between individual plates cannot be seen, because they are hidden beneath the oceans.
    - Yet oceanic plate boundaries can be mapped accurately from outer space by measurements from GEOSAT satellites.
    - **Earthquake and volcanic activity is concentrated near these boundaries**.

When Did Tectonic Plates Develop on Earth?



- Tectonic plates probably developed very early in the Earth's 4.6-billion-year history, and they have been drifting about on the surface ever since-like slow-moving bumper cars repeatedly clustering together and then separating.
- Like many features on the Earth's surface, plates change over time.
- Those composed partly or entirely of oceanic lithosphere can sink under another plate, usually a lighter, mostly continental plate, and eventually disappear completely.
- This process is happening now off the coast of Oregon and Washington in North America.
- The **small Juan de Fuca Plate**, a remnant of the formerly much larger oceanic Farallon Plate, will someday be entirely consumed as it continues to sink beneath the North American Plate. Geography

Impact of a SC Order on Telcos' Licence Fee Tax

Why in News?

- The Supreme Court of India has held that payment of entry fee as well as variable annual licence fee made by telcos will be considered capital expenditure and not revenue expenditure and taxed accordingly.
- In a blow to telecom companies in the country, **the decision could bring in additional tax liabilities** (~$1 billion in the current fiscal year) **for them** - especially for older telcos Bharti Airtel and Vodafone Idea.

What's in Today's Article?

- What did the Supreme Court Rule?
- How will the Order Impact Telcos?
- Concerns Regarding the SC Order

What did the Supreme Court Rule?

- Disposing an appeal by the Income Tax Department, a Division Bench of the SC held that -
    - The payment of entry fee as well as the variable annual licence fee paid by the respondents-assesses to the DoT (Department of Telecommunication) under the (New Telecom) Policy of 1999 are capital in nature, and
    - May be amortised in accordance with Section 35ABB of the (Income Tax) Act.
- **This essentially means** that instead of deducting the entire expenditure all at once, the company will need to deduct a portion of the total fee over each year for tax purposes.
- As part of its judgement, **the top court also set aside a Delhi HC order** that categorised licence fees before and after July 31, 1999, differently, as capital expense and revenue expense, respectively.

    - **As per the National Telecom Policy 1999**, telecom operators had to pay a one-time licence fee to start operations, along with a yearly licence fee based on their annual turnover.
    - This was in contrast to the earlier policy, wherein they had to pay licence fee in one go.
    - **The SC noted** that the migration to the 1999 telecom policy (from 1994 policy) and variable nature of payments, does not change the licence fee's essence.

How will the Order Impact Telcos?

- **Currently**, telecom companies treat licence fees as an expense, claiming deductions on account of variable licence fees on a year-to-date basis for computing their tax liability.
- After the judgement, **the licence fee would have to be treated as a capital expense**, with a provision for amortisation of the licence fee over the licence period.
- Prima facie, the accounting change **would lead to higher EBITDA/PBT and lower cashflow on higher tax outgo initially**, but would likely even out over the licence holding period.
    - **EBITDA** is an acronym for Earnings Before Interest, Taxes, Depreciation, and Amortisation. **PBT** stands for Profit Before Tax.
    - They usually show **how the net profit of the company stands reduced due to the impact of Interest, Depreciation, and Tax**.

Concerns Regarding the SC Order:

- The various telecom operators who have incurred substantial expenses to obtain a licence **will have to revisit the position taken with respect to the deductibility of the expense**.
- The disallowance of the expenses **would adversely impact the companies which are already suffering a huge loss**.
- **The SC's order has not clarified** whether the changes to the accounting structure will have to be made on a retrospective basis.
- According to the Kotak report, **the income tax authorities are expected to raise demand** for the shortfall in tax payment for the prior period, along with applicable penalties.
- **Telecom companies are likely to file a review petition** and the actual tax liability could get delayed. Polity & Governance

Rau's

RapidX | **UPSC Syllabus:** Prelims: Infratsructure

Sub Theme: Rapid railway | UPSC

All set for launch,RapidX offers high-speed travel,modern amenities at affordable price.

#prelims Infrastructure and transport #Economy #primary source-The Hindu
Context: - The maiden voyage of the Delhi-Meerut Regional Rapid Transit System (RRTS), also known as RapidX, will begin services on a 17km stretch out of 82km long route as part of Delhi-Meerut RRTS which will cover five stations from **Sahibabad to Duhai Depot** eventually.

About RapidX

- It is **India's first** Regional Rapid Transport system.
- It is **nation's fastest** inter-state transit system.
- The **priority section includes 5 stations: Sahibabad, Ghaziabad, Guldhar, Duhai and Duhai Depot.**
- The **National Capital Region Transport Corporation (NCRTC),** the nodal agency of RapidX, has **set 2025 as the deadline** for the entire 82-km corridor to be operational.
- According to NCRTC, the RAPIDX services will be the **nation's first railway system** with the **maximum operational speed of 160 kmph** along its entire length.
- The trainset of the Delhi-Meerut RRTS boasts an **average speed of 100 km/h**r.

Amenities provided:- one reserved coach for women, parking space at railway station, QR code based paper tickets, ticket vending machine used to recharge National Common Mobility Card, automatic fare collection gates ,all doors have first of its kind manual locks to curb the glitches of automatic doors, multiple CCTV are installed to enhance security, ambulance services can be availed through centralised accident and trauma centre, provisions likes wheelchair, stretchers for differently abled people.

Potential benefits of RapidX

- **Reduced travel time**: RRTS systems are typically much faster than other modes of transportation, such as cars and buses. This can save people a significant amount of time on their commute, which can improve their quality of life and productivity. For instance**, RapidX** will **take one hour to cover 82 km of distance**.
- **Reduced traffic congestion**: RRTS systems can help to reduce traffic congestion by taking cars off the road especially in National Capital Region. This can improve air quality and make it easier for people to get around.
- **Increased economic activity**: RRTS systems can help to boost economic activity by making it easier for people to travel to and from work, school, and other destinations. This can also help to attract new businesses and residents to the region.
- **Improved social equity**: RRTS systems can help to improve social equity by making transportation more accessible to everyone, regardless of income or social status. This can give people more opportunities to participate in the economy and society.
- **Boost to satellite town**: RRTS helps to decongest NCR region by giving boost to economic opportunity in satellite town, reduce migration to NCR region and thereby help in regional development.

Practice Question
With reference to RapidX, consider the following statement: -
(1) It has operational speed more than railway and metro.
(2) It is nations first Rapid Regional transport system.
(3) It can reduce air pollution in NCR region.
(4) It will connect Delhi to Bharatpur.
How many of the above statement are correct?
(A) Only one (B) only two (C) Only three (D) All four
Answer-C
Statement 1 is correct- According to NCRTC, the RAPIDX services will be the nation's first railway system with the maximum operational speed of 160 kmph along its entire length.
Statement 2 is correct.
Statement 3 is correct-It will decrease the use of private vehicles >decongest roads > reduce waiting times at red lights>thereby reduce emissions of fuel exhaust, hence help to reduce air pollution.
Statement 4- is Incorrect- It will connect Delhi to Meerut.

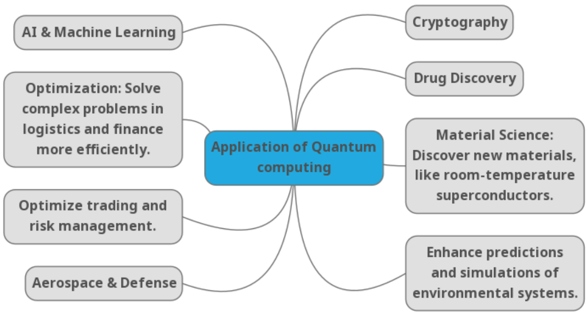
What is Quantum computing?

- Quantum computing is a field of study focused on the development of computer-based technologies cantered around the principles of quantum theory.
- Quantum theory, a subfield of physics, describes the nature of energy and matter on the quantum (atomic and subatomic) scale.

Principles of Quantum computing

- **Superposition:** A qubit can represent both 0 and 1 simultaneously.
- **Entanglement:** States of qubits become interlinked, allowing coordinated processing.
- **Interference:** Quantum states combine to amplify correct solutions and cancel out wrong ones.
- **Tunnelling:** Particles can pass through barriers, aiding in optimization tasks.
- **Measurement:** Extracts a result from a qubit, collapsing its state to either 0 or 1.
- **Quantum Gates:** Operations that manipulate qubits, analogous to classical logic gates.
- **No-Cloning:** Qubits can't be precisely copied.
- **Decoherence:** External influences can cause errors, requiring error correction.

Application of Quantum computing


AI & Machine Learning
Optimization: Solve complex problems in logistics and finance more efficiently.
Optimize trading and risk management.
Aerospace & Defense
Application of Quantum computing
Cryptography
Drug Discovery
Material Science: Discover new materials, like room-temperature superconductors.
Enhance predictions and simulations of environmental systems.

What is classical computing?
Classical computing refers to the traditional model of computing based on classical physics principles and the binary system.

- **Bits:** The fundamental unit of classical computing. A bit can be in one of two states: 0 or 1.
- **Logic Gates:** Operations that manipulate bits. Common gates include AND, OR, NOT, XOR, and others. These gates form the building blocks of digital circuits and processors.
- **Binary System:** Classical computers operate using the binary numeral system, where data and instructions are represented using combinations of 0s and 1s.
- **Deterministic:** Classical computers operate in a deterministic manner, meaning given the same input, they will always produce the same output.
- **Stored-Program Concept:** Modern classical computers follow this concept, where instructions (software) and data are stored in memory and processed by a central processing unit (CPU).
- **Architecture:** Classical computers typically have a CPU, memory (RAM), storage (hard drive or SSD), input/output devices, and other components interconnected by a system bus.
- **Applications:** Classical computing encompasses a wide range of devices, from simple calculators to supercomputers, and is used in virtually every industry and aspect of modern life.
- **Limitations:** There are problems that classical computers find challenging or time-consuming, such as factoring very large numbers or simulating quantum systems. This is where quantum computing may offer advantages.

Quantum computing vs Classical computing

Feature/Aspect	Quantum Computing	Classical Computing
Basic Unit	Quantum bits (qubits)	Binary bits (0 or 1)
State Representation	0, 1, or a superposition of both	Either 0 or 1
Parallelism	Can process multiple possibilities simultaneously	Processes tasks sequentially or with limited parallelism
Entanglement	Qubits can be entangled	No equivalent phenomenon
Operations	Uses quantum gates	Uses logic gates (AND, OR, NOT, etc.)
Determinism	Probabilistic outcomes	Deterministic outcomes
Data Storage	Quantum states (fragile)	Electronic storage (RAM, SSDs, hard drives)
Error Correction	Requires quantum error correction	Uses classical error correction methods
Maturity & Applications	Early stages with specific potential applications	Mature, used in countless applications
Hardware	Specialized conditions (e.g., very low temperatures)	Operates at room temperature with semiconductor technology

Benefits of quantum computing

- **Speed:** Solve specific problems exponentially faster.
- **Parallelism:** Process vast information simultaneously.
- **Optimization:** Efficiently tackle complex optimization tasks.
- **Simulation:** Directly simulate quantum systems for research.
- **Cryptography:** Enable ultra-secure quantum encryption.
- **Machine Learning:** Accelerate training and improve accuracy.
- **Material Discovery:** Efficiently find new materials with desired properties.
- **Climate Modeling:** Achieve more accurate environmental simulations.
- **Enhanced Search:** Quickly search through unsorted databases.
- **Error Correction:** Advanced techniques applicable beyond just quantum computing.

Limitations of quantum computing

- **Decoherence:** Qubits are unstable and lose information over time.
- **Error Rates:** High error rates compromise computation reliability.
- **Scalability:** Difficult to build large-scale quantum systems.
- **Quantum-to-Classical Transition:** Information loss when translating quantum results into classical data.
- **Selective Speedup:** Not universally faster; speed benefits apply to specific problems.
- **Algorithm Complexity:** Quantum algorithms are intricate and hard to design.
- **Hardware Demands:** Requires extreme conditions (e.g., very low temperatures) to function.
- **Error Correction:** Needs many extra qubits, complicating design.
- **Immature Software:** Lacks a robust software ecosystem.
- **Cryptography Risks:** Threatens current encryption methods.
- **Practicality:** Many quantum solutions have limited immediate real-world use.

Practice Question
Q. Consider the following statements regarding Quantum Computing:
1. Quantum Computing relies on the principles of classical mechanics for its operation.
2. Quantum Computers utilize qubits which can exist in multiple states at once, unlike classical bits that can exist only in a state of 0 or 1.
3. Quantum Computing has the potential to significantly accelerate certain types of calculations compared to classical computers.
How many of the statements given above are correct?
a) Only one
b) Only two
c) All three
d) None
Ans: (b)
Statement 1 is incorrect as Quantum Computing relies on the principles of quantum mechanics, not classical mechanics.
Statement 2 is correct as qubits, or quantum bits, can exist in a superposition of states, which allows them to perform multiple calculations simultaneously.
Statement 3 is correct as the inherent parallelism of quantum computing allows it to significantly accelerate certain types of calculations, such as factoring large numbers or simulating quantum systems, compared to classical computers.

Artificial Intelligence | **UPSC Syllabus:** Prelims: Science and Technology**Sub Theme:** Mains: Science and technology | UPSC

Artificial Intelligence and its regulation

#Internet & Communication Technology
Primary Source: The Hindu

Context: The growth of AI technologies and their deployment has raised certain fears related to privacy and surveillance, job automation leading to loss of employment, and the possibility of a loss of control over AI resulting in existential risks for humanity.
Artificial Intelligence:

- **Artificial Intelligence** (AI) is the simulation of human intelligence processes by machines, especially computer systems. Machines can perform cognitive tasks like thinking, perceiving, learning, problem-solving and decision-making.

- **Generative AI** is a type of AI that involves creating new, original content or data using machine-learning algorithms. Generative AI works by training a model on a large dataset and then using that model to generate new, previously unseen content. It can be used to generate text, images, music, code etc. **E.g.,** DALL-E for image generation, ChatGPT for text generation.

- An important difference between humans and AI machines is the uniqueness and capability of the human mind known as **Artificial general intelligence**. This means humans can think about a problem from scratch and try to solve it, which the AI machines are presently not capable of.

Regulation of AI:

- **Good AI** refers to the **responsible and ethical use of artificial intelligence**. It is designed to adhere to principles of transparency, fairness, privacy, and human dignity to maximize the positive impact of AI while minimizing potential risks and negative consequences.
- **Bad AI** refers to the unethical and malicious use of AI technologies with the intent to deceive, manipulate, exploit, or cause harm.

There is a need to regulate AI due to several concerns, which include:

- **Disinformation and Manipulation**: One significant concern is the ability of AI to generate falsified data, making it increasingly difficult to differentiate between authentic information and manipulate public narratives. **E.g.,** deepfakes.
- **Data bias:** Generative AI systems can perpetuate and amplify existing biases. If AI algorithms are trained on biased data or developed with inherent biases, they will generate biased outputs and prejudicial content.
- **Lack of Transparency**: Algorithms of AI can be so inordinately complex that even those who created the algorithm cannot thoroughly explain how the variables led to the resulting prediction. This opacity poses the risk of exclusion and discrimination by AI in decision-making.
- **Loss of Jobs**: AI systems have the potential to automate tasks traditionally performed by humans, which could lead to job displacement and economic disruption.
- **Privacy Violations:** AI applications can collect and analyse personal data without consent leading to violations of privacy and copyright infringement. This includes surveillance systems that infringe upon individuals' privacy rights or AI-powered algorithms that extract sensitive information without appropriate safeguards.
- **Cybersecurity Threats**: AI can be used by malicious actors to enhance cyber attacks, such as sophisticated phishing attempts, automated hacking tools, or AI-driven malware, causing significant financial, personal, or infrastructure damage.
- **Autonomous Weapons**: The development of autonomous weapons systems powered by AI raises concerns about the potential for these systems to act independently and make lethal decisions without human control or oversight.
- **Ethical concerns:** There is no legal accountability and responsibility arising out of the decisions made by AI.

- **Technological rivalry and regulations**: In the absence of regulations, intensifying rivalry between technological giants like the United States and China, may risk misuse of AI for malicious purposes.

Way Forward:
Hence, AI should be regulated to ensure that the technology's development is guided by human-centric principles. The solutions include:

- **Comprehensive regulatory framework**: India needs a comprehensive regulatory framework with both horizontal regulations (that would be applicable across sectors) and vertical regulations (sector-specific). There is a need to identify the capabilities of AI that are more susceptible to misuse than others to promote the responsible use of AI.
- **Ensure privacy protection:** As data is the backbone of AI; businesses must learn to access data while ensuring its privacy, integrity and security. There is a need for laws to deploy AI-based systems to comply with Supreme Court requirements under the right to privacy judgment for specific use cases. **E.g.,** European Union has implemented the General Data Protection Regulation to protect the privacy of individuals when their data is used by AI systems.
- **Open-Source AI Risk Profile**: Indian government should proactively establish and maintain an open-source AI risk profile. This initiative would encourage transparency, collaboration, and the sharing of best practices in AI research and development.
- **Elimination of black-box approach:** Mandatory explanation for AI systems that how a particular result was reached or details of the steps involved in the analysis will usher in transparency and review the data in each step to unearth biased results.
- **Sandboxed R&D Environments**: Setting up sandboxed research and development environments can facilitate the testing and evaluation of potentially high-risk AI models. By creating controlled environments, researchers can assess the impact and potential risks associated with these models before their widespread deployment.
- **Creating oversight bodies:** Governments can create agencies or committees to oversee the development and deployment of AI. These bodies can be responsible for ensuring compliance with regulations and monitoring the impact of AI on society.
- **Common International regulation of AI:** Governments, together with other stakeholders, must work together to design guardrails for private-sector innovation and develop a common framework for international regulation of AI.
- **Reskilling of workers:** Providing AI-related skill training to workers to remain relevant in the job market like expertise in programming, data analysis, and algorithm development.

India must strike a balance between innovation and regulation, ensuring that AI technologies are leveraged for the betterment of society while safeguarding against potential misuse or harm.

Left Wing extremism |

UPSC Syllabus: Prelims: Internal Security **Sub Theme:** Internal Security | UPSC

1. LEFT WING EXTREMISM

- Left-wing extremists in India, as elsewhere, are known for resorting to violence in pursuance of their ideology of peoples' revolutionary movement. In West Bengal, this movement was started in 1967 from Naxalbari.
- The first flush of the Left Extremist movement in the Naxalbari region was effectively controlled without much bloodshed and within a relatively short span of time.
- The movement spread beyond west Bengal and came to be known as Maoist movement since 2004 after the merger of various splinter groups into **CPI (Maoist).** This was followed by their increasing militarisation and simultaneous acquisition of sophisticated firearms and ammunitions.

AFFECTED AREAS

Naxalites operate in what is known as the **"Red Corridor"** 106 districts across 10 states in India, mainly in the states of Odisha (5 affected districts), Jharkhand (14 affected districts), Bihar (5 affected districts), Andhra Pradesh, Chhattisgarh (ten affected districts), Madhya Pradesh (8 affected districts), Maharashtra (2 affected districts) and West Bengal (8 affected district).

CAUSES FOR LEFT WING EXTREMISM

Land Related Factors:

- Evasion of land ceiling laws.
- Existence of special land tenures (enjoying exemptions under ceiling laws).
- Encroachment and occupation of Government and Community lands (even the waterbodies) by powerful sections of society.
- Lack of title to public land cultivated by the landless poor.
- Poor implementation of laws prohibiting transfer of tribal land to non-tribals in the Fifth Schedule areas.
- Non-regularisation of traditional land rights.

Displacement and Forced Evictions:

- Eviction from lands traditionally used by tribals.
- Displacements caused by irrigation and power projects without adequate arrangements for rehabilitation.
- Large scale land acquisition for 'public purposes' without appropriate compensation or rehabilitation.

Livelihood Related Causes:

- Lack of food security – corruption in the Public Distribution System (which is often non-functional).
- Disruption of traditional occupations and lack of alternative work opportunities.
- Deprivation of traditional rights in common property resources.

Social Exclusion:

- Denial of dignity.
- Continued practice, in some areas, of untouchability in various forms.
- Poor implementation of special laws on prevention of atrocities, protection of civil rights and abolition of bonded labour etc.

Governance Related Factors:

- Corruption and poor provision/non-provision of essential public services including primary health care and education.
- Incompetent, ill-trained and poorly motivated public personnel who are mostly absent from their place of posting.
- Misuse of powers by the police and violations of the norms of law.
- Perversion of electoral politics and unsatisfactory working of local government institutions.

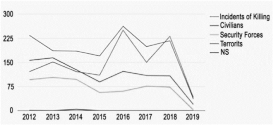
These causes are most glaring in forest areas predominantly inhabited by tribal populations who thus become the main instruments and victims of left extremist violence.

Sources of Funding for Naxalites:

- Financial mobilisation by Naxalites is in the form of extortion from local people and from contractors executing various projects in the affected areas. Besides, funds are also raised through forest and mining operations.
- The extensive contractor-transporter-extremist nexus and its links with illegal mining and collection of forest produce in the entire region affected by left extremism yields a huge volume of funds for the extremists.

CURRENT STATUS OF THE SPREAD

- The decrease in instances of LWE activities started from 2011 and has continued till date.
- The number of districts affected by left-wing extremism (LWE) has declined sharply to 70 in 10 states for the first time in over three decades, with Bihar, Odisha and Jharkhand showing the biggest improvement.
- Only 25 districts in eight states are now categorised as "most affected.
- Overall, the incidents of LWE violence have reduced by 70% from an all-time high of 2,258 in 2009 to 665 in 2020. Similarly, the deaths of security forces and civilians have come down by 80% from all time high of 1,005 in 2010 to 183 in 2020
- The shrinkage of geographical spread of LWE influence is evident in reduced violence in the last six years (from 2015 to 2020), with 47% fewer incidents compared with the preceding 6 years (from 2009 to 2014).
- The recruitment of Maoists has come down, their leadership is old, and the party ideology is missing among the young cadres due to which the pockets of their activities have been restricted enormously over the years. There is also better intelligence sharing between agencies, disruption of logistics chains like weapons, money and food items and they are not able to recruit cadres from any state other than Chhattisgarh.
- Bihar, where the Maoists once enjoyed widespread support among the poor, has shed the highest (six) number of districts in the latest list, with only 10 districts now affected by LWE
- Odisha, where the state government has a formidable anti-Naxal force, the Special Operations Group (SOG), districts affected by Maoism have come down from 15 to 10.
- Jharkhand has shown significant improvement with only 16 districts now affected by LWE against 19.
- Chhattisgarh, where the worst violence has been reported over the years, continues to have 14 affected districts.
- There is no change in the LWE situation in Kerala and West Bengal, where three districts and one district, respectively, are affected by LWE; while Madhya Pradesh now has three affected districts as compared to two earlier.



Government’s Approach and Action Plan to curb LWE

The Government of India has adopted an integrated and holistic approach to deal with the Left-Wing Extremist (LWE) insurgency by simultaneously addressing the areas of **security, development and promoting good governance**. To achieve this, a National Policy and Action Plan has been put in place that adopts a multi-pronged strategy in the areas of security, development, ensuring rights & entitlements of Other Traditional Dwellers / Tribals etc with focused attention on 106 Districts in 10 States and particularly in 35 most affected LWE districts in 07 States.

Specific Measures taken by Central government: ‘Police’ and ‘public order’ are state subjects. Central government, however, closely monitors situation and coordinates and supplements their efforts in several ways to deal with the LWE problem.

- **Ban on CPI (Maoist):** This organisation is responsible for most incidents of violence/casualties.
- **Strengthening the Intelligence Mechanism:** This includes intelligence sharing through Multi-Agency Centre (MAC) at the Central level and State Multi Agency Centre (SMAC) at the State level on 24x7 basis.
- **Better Inter-State coordination:** The menace of Maoists is spread across various states. Thus, Government of India has taken several steps to improve Inter-State coordination through periodic Inter-State meetings and facilitating interactions between the bordering districts of LWE affected States.
- **Tackling the problem of Improvised Explosive Devices (IEDs):** Majority of casualties incurred by the Security force are attributable to IEDs. The Ministry of Home Affairs has formulated an SOP on ‘Issues related to Explosives/IEDs/Landmines in Naxal Affected Areas’ and circulated to all stakeholders concerned for compliance.
- **Deployment of the Central Armed Police Forces**
- **India reserve (IR)/Specialised India Reserve Battalion (SIRB):** The Left-Wing Extremism affected states have been sanctioned India Reserve (IR) battalions mainly to strengthen security apparatus at their level and to enable the States to provide gainful employment to youth, particularly in the LWE affected areas.

Development related Measures

Monitoring and Implementation of Flagship Programs:

(a) Pradhan Mantri Gram Sadak Yojana (PMGSY)
(b) National Rural Health Mission (NRHM)
(c) Ashram School
(d) Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
(e) Sarva Shiksha Abhiyan (SSA)
(f) National Rural Drinking Water Program (NRDWP)
(g) Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
(h) Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY)
(I) Integrated Child Development Services (ICDS)
(j) Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006.

Other Measures

- Effective Implementation of **PESA Act** and **FRA.**
- **Road Connectivity Project for LWE Affected Areas:** Government has approved a namely Road Connectivity Project for Left Wing Extremism Affected Areas to improve the rural road connectivity in the worst LWE affected districts from security angle.
- **LWE Mobile Tower Project:** To address connectivity issues in LWE.
- **Civic Action Program (CAP):** Financial grants are allocated to Central Armed Police Forces (CAPF) to undertake various Civic Action Programs in LWE affected areas.
- **Surrender and Rehabilitation Policy:** Rehabilitation package includes an immediate grant of Rs. 2.5 lakh for higher ranked LWE cadres and Rs. 1.5 lakh for middle/lower rank LWE cadres to be kept in their names as Fixed deposit which may be withdrawn after completion of 3 years subject to good behaviour. They are also imparted training in a trade / vocation of their liking and paid a monthly stipend of `4000 for three years.
- **SAMADHAN Strategy:** The solution to the LWE problem is not possible with any silver bullet. For this short term, medium term and long-term policies need to be formulated at different levels. Thus ‘SAMADHAN’ stands for:
  S - Smart Leadership
  A - Aggressive Strategy
  M - Motivation and Training
  A - Actionable Intelligence
  D - Dashboard Based KPIs (Key Performance Indicators) and KRAs (Key Result Areas)
  H - Harnessing Technology
  A - Action plan for each Theatre
  N - No access to Financing

Suggestions for addressing LWE

Left extremism feeds on persistent and serious shortcomings in the domain of general and development administration, resulting in the failure of the government to address the needs of the poor in areas pertaining to land, food, water and personal security, equity, ethnic/cultural identity etc. The ‘containment’ of the problem may inter alia require consideration of the following:

- Most of the ‘participants’ in violence perpetrated under the banner of left extremist organisations are alienated sections of society rather than perpetrators of ‘high treason’ – they have to be treated as such.
- A fortiori police action over a long period is counter-productive; it is likely to affect the innocent more than the extremists.
- Negotiations have a definite ameliorative role under the circumstances; this is the experience the world over.
- Faithful, fair and just implementation of laws and programs for social justice will go a long way to remove the basic causes of resentment among aggrieved sections of society.

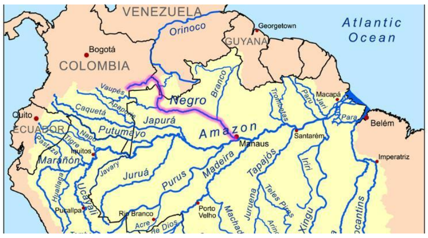
Sustained, professionally sound and sincere development initiatives suitable to local conditions along with democratic methods of conflict resolution have to be developed.

1. UPSC Current Affairs: **Draught in amazon** |

UPSC Syllabus: Prelims: Environment **Sub Theme:** Climate change and disasters | UPSC

Severe spell of drought in the Amazon: Causes,Impact, Warning Bells

#Preliminary-Ecosytem
#Disaster management,Rainforest
#Primary Source -The Indian Express
Context:-The Amazon rainforest is reeling under a severe drought**. The Rio Negro, one of the World’s largest rivers by discharge level has fallen to record level of 13.59 meter**s. Governor of Amazon has declared a state of emergency in more than 50 towns and cities of Amazons.



About Amazon

- The Amazon rainforest is the world's largest tropical rainforest called planets lung.
- Covers nearly 7 million square kilometers.
- Stores more than 150 billion metric tons of Carbon.
- It also produces about 20% of the world's oxygen.
- The Amazon rainforest is located in South America, and is shared by nine countries: Brazil, Bolivia, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela.

Recent status

- In the past 5 decades, between 17 and 20 percent of the Amazon has been destroyed.
- Brazilian Authority fear that about 5 lakh may be affected due to drought.
- Rise in wildfires, October month witnessed 2700 blazes which is highest in last 25 years.
- Air quality has deteriorated significantly.
- According to Nature Journal, Amazon has become slower at recovering from longer periods of droughts over the past 20 years and is nearing tipping point. Beyond the tipping point , it would transform from a lush green forest into drier open savanna, releasing the large amount of stored carbon , thereby exacerbating global warming.

Major reasons

- Deforestation
- El Nino year also triggering extreme heat.
- Unusually high temperature in the northern tropical Atlantic ocean. Due to warmer ocean waters ,heated air rises into the atmosphere which then reaches the Amazon forest. The warm air inhibits the formation of clouds, causing rainfall to drop sharply.